

New U.S. Patent Application Inventors: R. JURECIC et al. Title: HEPP, A Novel Gene with a Role in Hematopoietic and Neural Development" Attorney Docket No. 39532.176599 Sheet 1 of 14

FIGURE 1A

1	CCCCGCGTCGGTCTTCCACCTTTCGAGCTGGCCGCCGCTTGCTGTGCGCAGTTTC	60
61	GGGGGACTGGACCTTCCCTGGCTTTTAGCAGCGCCGAGCGCCATGGCGACCCTTTGCTGG	120
121	GCAGGTGACCGATTCCGGGTGCCCGAAGGAGCTGGCGTGGGTCTGCCTTGCAGCCGCCCG	180
	CCTGGACAGGATGTTTGCTAGAGGGCTGAAGAGGAAATATGGTGACCAGGAAGAAGAGT	240
1	MFARGLKRKYGDQEEGV	17
241	AGAGGGTTTTGGCACTGTCCCTTCCTATAGCCTGCAGCGACAGTCACTCCTGGACATGTC	300
	EGFGTVPSYSLQRQSLLDMS	37
301	CCTTGTCAAGCTCCAGCTCTGTCACATGCTAGTGGAGCCCAATCTCTGCCGCTCGGTCCT	360
	LVKLQLCHMLVEPNLCRSVL	57
361	CATCGCCAACACAGTCCGGCAGATCCAGGAGGAAATGAGCCAGGATGGTGTGTGGCATGG	420
	I A N T V R O I Q E E M S Q D G V W H G	77
421	GATGGCACCCCAGAATGTAGATCGGGCACCAGTTGAACGCCTGGTGTCCACAGAGATCCT	480
421		97
481	GTGTCGTACAGTGAGGGAGCTGAGGAAGAGCACCCTGCTCCTGAACTGGAAGATGCTCC	540
	CRTVRGAEEEHPAPELEDAP	117
541	CTTGCAAAACTCGGTTTCCGAGCTCCCCATCGTTGGCTCAGCACCAGGGCAAAGGAACCC	600
	LQNSVSELPIVGSAPGQRNP	137
601	TCAGAGCAGCCTCTGGGAGATGGACAGCCCACAAGAAAACAGGGGAAGCTTTCAGAAGTC	660
	Q S S L W E M D S P Q E N R G S F Q K S	157
661	ACTGGACCAGATATTTGAGACCCTGGAGAACAAAAACTCCAGTTCAGTGGAGGAACTCTT	720
	L D Q I F E T L E N K N S S S V E E L F	177
721	CTCAGATGTGGACAGCTCCTACTATGACCTGGACACAGTGCTAACAGGAATGATGAGTGG	780
721	S D V D S S Y Y D L D T V L T G M M S G	197
701	GACCAAGTCCAGTCTCTGCAATGGCCTTGAGGGCTTTGCTGCAGCCACCCCTCCTCCCAG	840
781		
		217
841		
	TTCCACTTGCAAGTCTGACCTGGCTGAGCTGGACCATGTGGTAGAGATTCTGGTGGAGAC	900
	S T C K S D L A E L D H V V E I L V E T	237
901		
901	S T C K S D L A E L D H V V E I L V E T	237
	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT	237
961	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT *	237 960
961 1021	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCAGTGGGCTAAGGGTGAGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT	237 960 1020
961 1021	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTGGGCAATA	237 960 1020 1080
961 1021 1081 1141	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTTATACTTTAGATTTTTTCAGCTATTTTC	237 960 1020 1080 1140 1200
961 1021 1081 1141 1201	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT	237 960 1020 1080 1140 1200 1260
961 1021 1081 1141 1201 1261	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTC TTAAAAGTATATTTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC	237 960 1020 1080 1140 1200 1260 1320
961 1021 1081 1141 1201 1261 1321	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATTTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAG	237 960 1020 1080 1140 1260 1320 1380
961 1021 1081 1141 1201 1261 1321 1381	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATTTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC	237 960 1020 1080 1140 1260 1320 1380 1440
961 1021 1081 1141 1201 1261 1321 1381 1441	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAACATTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCTTCCTAGCCCCCGTGTGCAGGATGGCTTTATT	237 960 1020 1080 1140 1200 1320 1380 1440 1500
961 1021 1081 1141 1201 1261 1321 1381 1441	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAACATTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAG TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTGTGCAGGATGGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTCAAGGTCTTACTCCTAGAAATCCCAAC	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1560
961 1021 1081 1141 1201 1261 1321 1381 1441 1501	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTTAAACTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTGTGCAGGATGGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGGACTGCTGTGAGGCAGTCCTTATCCTTGGCCATC	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1560 1620
961 1021 1081 1141 1201 1261 1321 1381 1441 1501 1561 1621	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTTAAACTTTTATACTTTAGATTTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTTGTCAGAGATGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGGACTGCTGTGAGGCAGTGCCTTATGCAGGTCTTTGTCCTTGGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1560 1620 1680
961 1021 1081 1141 1201 1261 1321 1381 1441 1501 1561 1621	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTTAAACTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTGTGCAGGATGGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGGACTGCTGTGAGGCAGTCCTTATCCTTGGCCATC	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1560 1620
961 1021 1081 1141 1201 1261 1321 1381 1441 1501 1561 1621 1681	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTTAAACTTTTATACTTTAGATTTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTTGTCAGAGATGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGGACTGCTGTGAGGCAGTGCCTTATGCAGGTCTTTGTCCTTGGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1560 1620 1680
961 1021 1081 1141 1201 1261 1321 1381 1441 1501 1561 1621 1681 1741	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTGTGCAGGATGGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGACTGCTGTGAGGCAGTGCCTTATGCCGTTTTTCCTTGGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1620 1680 1740
961 1021 1081 1141 1201 1261 1321 1381 1441 1501 1661 1621 1681 1741 1801	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTTAAACTTTTTATACTTTAGATTTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTTCCTTAGCCCCGTGTGCAGGATGGCTTTATT TATGCCTATTTATATGTAAATGCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGACTGCTGTGAGGCAGTGCCTTATTGCCTTTGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1620 1680 1740 1800
961 1021 1081 1141 1201 1261 1321 1381 1441 1501 1661 1681 1741 1801 1861	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTAACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTTGCAGGAAGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGACTGCTGTGAGAGCTATAGGAGGTCTTTGTCCTTGGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1620 1680 1740 1800 1860
961 1021 1081 1141 1201 1321 1381 1441 1501 1661 1681 1741 1801 1861	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTATACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAACATTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAG TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTGTGCAGGATGGCTTTATT TATGCCTATTTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGACTGCTGTGAGGCAGTGCCTTATGCAGGTCTTGTCCTTGGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1620 1680 1740 1800 1920 1980
961 1021 1081 1141 1201 1321 1381 1441 1501 1661 1681 1741 1801 1861 1921	S T C K S D L A E L D H V V E I L V E T CTGAGAGGCCACCCCAGTGGGCTAAGGGTGAGGCCACCAGTCCCCATGGAGCTCACGTGT * GTTGTGACCCAGAGACAGATAAGCACTTGTCCTAAGAGGGGGCTCTGGCTCTTGAGCTCAT TATCCTTTTGTGTGACATTGGACTCACTGTGGAGGATGGTGTGTCACAGCTATGTCTAGT CTATTTTCAATTAGATAGGTGAACTTTCTAAAATTAAGTTTTATATGTTTTTGGGCAATA TTTTGTCTTAAGATATATTTTTTAAACTTTTTAACTTTAGATTTTTTCAGCTATTTTC TTAAAAGTATATTTTTTCTACAAACATCCTCTGCTGCTACATTAGAAACATTTATAACCT AAATACGATTGGTGTGTCATTTTAAAGGTTTAAATAGAAAACTTCTTTTGTTACTGAGTC TCTACACTCCCAAGGCAACTGTAAATGTAGCCGGCCGGGTGTTTACATGAGAGGCTCCAC TATGGTCTACATTCTAGTAGAGCTTGAAAAGAACCATGCACAGCTCCACTGCCCCCTCAC TGGGTCTGCTCTGGCGGATCGGAGCTCTCTTCCTAGCCCCGTTGCAGGAAGCTTTATT TATGCCTATTTATATGTAAATGCCACTGAAAGCTAAGGTCTTACTCCTGGAAATCCCAAC ACCAGTTCTTCAGGGACTGCTGTGAGAGCTATAGGAGGTCTTTGTCCTTGGCCATC ACTGTCTGGTTCCCAGCCCAG	237 960 1020 1080 1140 1200 1320 1380 1440 1500 1620 1680 1740 1800 1920

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FIGURE 1B

1 GGGARAGCTGGCGGCACAGCCTGGCGGCTGGACAGGACCCCGGCGGGCCTCG	_		60
1	_		
121 ACGTGGAGGGAGCCTGGCGGGTTGAAGACAGTGTCCTCATACAGCCTGCAGCGGCAGT			
V			-
181 CGCTCCTGGACATGTCTCTGGTGAAGTTGCAGCTTTGCACATGCTTGTGGAGCCCCAACC	121		
L L D M S L V K L Q L C H M N L V E P N L 56 241 TGTGCCGCTCCGGTCCCAGTGCCCAACAGGGTCCGACGATCCAAGAGGAGGATGACGCCCAGGGTGCGCGCCGCCCCCAGGGGTGCGCGCCCCCCAGGGTGCGAGGGCGCGCCGCCCCCCCC			36
241 TGTGCCGCTCAGTCCTATTGCCAACAGCGTCCGGCAGATCCAAGAGGAGATGACGCAGG C R S V L I A N T V R Q I Q E E M T Q D 76 301 ATGGGACGTGGCGCACAGTGGCACCCCAGGCTCGAGAGGCGCCCTCGACCGCTTGG G T W R T V A P Q A A E R A P L D R L V 96 361 TCTCCACGGAGATCCTGTGCCCGCAGCGTGGAGGGGGAAGAGGGGGGCCACCTCCTGCTCCTG S T E I L C R A A W G Q E G A H P A P G 116 421 GCTTGGGGGACCCCACACACACAGGGTCCAGGTTTCTGACCTTTGCCCAGTCACCCTCAGCAC L G D G H T Q G P V S D L C P V T S A Q 136 481 AGGCACCAAGACCTGCAGAGCAGCGCCTGGGAGATGATGGAGCACCAGAGAGAACACAGAG A P R H L Q S S A W E M D G P R E N R G 156 541 GAAGCTTTCACAAGTCACTTGATCAGATATTTGAAACGCTGGAGACTAAAAAACCCCAGCT S F H K S L D Q I F E T L E T K N P S C 176 661 GCATGGAAGAGCACCTGCAGAGCAGCGCCTGGACACAAGAGAGAACACAAGAGAGAG	181	CGCTCCTGGACATGTCTCTGGTGAAGTTGCAGCTTTGCCACATGCTTGTGGAGCCCAACC	240
C			56
301 ATGGGACGTGGCGACAGTGGCACCCCAGGCTGCAGGCGGCGCCGCTCGACCGCTTGG	241	TGTGCCGCTCAGTCCTCATTGCCAACACGGTCCGGCAGATCCAAGAGGAGATGACGCAGG	300
G T W R T V A P Q A A E R A P L D R L V 96		CRSVLIANTVRQIQEEMTQD	76
361 TCTCCACGGAGATCCTGTGCCGTGCAGCGTGGGGGCAAGAGGGGGCACATCCTGCTCCTG S T E I L C R A A W G Q E G A H P A P G 116 421 GCTTGGGGGACGGCCACACACAGGGGTCCAGTTTCTGACCTTTGCCCAGTCACCTCAGCAC L G D G H T Q G P V S D L C P V T S A Q 136 481 AGGCACCAAGGCACCTGCAGAGCAGCGCCTGGGAGATGGATG	301	ATGGGACGTGGCGCACAGTGGCACCCCAGGCTGCAGAGCGGCGCCGCTCGACCGCTTGG	360
S T E I L C R A A W G Q E G A H P A P G 116		G T W R T V A P Q A A E R A P L D R L V	96
481 481 AGGCACCAAGGCCACCTGCAGAGCCCCTGGAGATTCTCTGACCTTTGCCCAGTCACCTCAGCAC L G D G H T Q G P V S D L C P V T S A Q 136 481 AGGCACCAAGGCACCTGCAGAGCAGCCCCTGGGAGATGGATG	361	TCTCCACGGAGATCCTGTGCCGTGCAGCGTGGGGGCAAGAGGGGGCACATCCTGCTCCTG	420
L G D G H T Q G P V S D L C P V T S A Q 136 481 AGGCACCAAGGCACCTGCAGAGCAGCCCTGGGAGATGGCCCCTGGAGAAACAGAG 540 A P R H L Q S S A W E M D G P R E N R G 156 541 GAAGCTTTCACAAGTCACTTGATCAGATATTTGAAACGCTGGAGACTAAAAAACCCCAGCT 600 S F H K S L D Q I F E T L E T K N P S C 176 601 GCATGGAAGAGCCTTCAGACGTGGACACGCCCTACTACGACCAGTACACAGTACTGA 660 M E E L F S D V D S P Y Y D L D T V L T 196 661 CAGGCATGATGGGGGGTGCCAGGCCGGGCCCCTGCGAAGAGCCTGGACACAGTACTGA 660 M B G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACGTGGACACAGTGCTGG 720 601 M M G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGACACAGTGCTGG 780 T P G P S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTGAGCAGGAGGCCCTAGCTCACAGCCCTTGCTGCAGGCCTTGCTCGG 780 601 CCTGTCTGCTGATTCTGAGAAATCCCAGGAGGCCCGGCCCAGCGCCCTCTGAAGGCTTGGCTCCG 960 901 CCTGTCTTGCTACTTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCCCAGCCCTTGCTGC 960 901 CCTGTCTTGCTACTTCTAGAAAATCCCAGAACAGCCCATTACCAGTGGGGCCCAGCCCTTGCTGC 960 1 L V E T * 241 841 ACACGTGAGCACTGCCCCCCCCTGTGGGCCCCAGCGAGGGGCCCAGCCCTTGCTGC 960 901 CCTGTCTTGCTACTTTTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCCCAGCCCTTGCTGC 960 1021 CTTGTCTTCTGAACGTCCCCACCTGGGCCCCTCTGTCTCTTTTGTGTCCCCCACTGT 1080 1081 AGAGGACGGTGAGCCGCAGCTGCATCAACCTCCTTTTAAGATATATTTTTTAAACTTTT 1200 1021 TATACCTTATCTCTTTTAGATTTTTTGGCCAGTATAACACTCCTTTTAAAATTTTTTTT		STEILCRAAWGQEGAHPAPG	116
ABGCACCAAGGCACCTGCAGAGCACCTGCAGAGCACCCCTCGAGAAAAACAGAG A	421	GCTTGGGGGACGGCCACACACAGGGTCCAGTTTCTGACCTTTGCCCAGTCACCTCAGCAC	480
A		L G D G H T Q G P V S D L C P V T S A Q	136
A	481	AGGCACCAAGGCACCTGCAGAGCAGCGCCTGGGAGATGGATG	540
541 GAAGCTTTCACAAGTCACTTGATCAGATATTTGAAACGCTGGAGACTAAAAACCCCAGCT 600 S F R K S L D Q I F E T K N P S C 176 601 GCATGGAAGAGCTGTCTCCAGAGGGGCAGGCCCTACTACTACGACCTGGACACAGTACTGA 660 M E L F S D V D D T V L T T 196 661 CAGGCATGATGGGGGGTGCCCAGGCCGGGGCCCTGGGGCCCTGGGGCCAGGGGGCCCGGGCCCCAGGGGGCCCCAGGGGGCCCAGGGGGCCCAGGGGGCCCAGGGGGG			156
S F H K S L D Q I F E T L E T K N P S C 176 601 GCATGGAAGAGCTGTTCTCAGACGTGGACAGCCCCTACTACGACCTGGACACAGTACTGA 660 M E E L F S D V D S P Y Y D L D T V L T 196 661 CAGGCATGATGGGGGGTGCCAGGCCCGGGCCCCTGCGAAGGGCTCGAGGGCTTGGCTCCGG 720 G M M G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGACCCAGTGGTGG 780 T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGCCTGAGCAGGAGGCCCTGAGGGCTTGACGCATTG 840 I L V E T * 841 ACACGTGAGCACTGAGCAGGAGGCCCTGAGGGCTCCACGCCCTTGACGCATTG 901 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCTTA 961 GGCCCGTCCACTCACCTCCCCCCTGTGGAACGCCCATTACCAGTGGGGCTGCAGCCTT 1020 CTTGTCTTCTGAGGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCTT 1030 AGAGGACGGTGAGCCCCACGCCCTGGGACCCCTCTTTTTTTT	541		600
GO1 GCATGGAAGAGCTGTTCTCAGACGTGGACAGCCCCTACTACGACCTGGACACAGTACTGA M E E L F S D V D S P Y Y D L D T V L T 196 661 CAGGCATGATGGGGGGTGCCAGGCCGGGCCCCTGCGAAGGGCTCGAGGGCTTGGCTCCGG G M M G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGACGGCTTGGACCACGTGGTGG T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTCCAGGAGGGCCTGAGTGCTCACAGGCCTTGACGCATTG I L V E T * 841 ACACGTGAGCACTGGCTCCACGGAGGGGTGGACCACGTGGTGC 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGGCTCAGCCCTTG 901 CCTGTCTTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGAGCCCCAG 901 CCTGTCTTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTCACAGCCCTAG 901 CCTGTCTTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTCCCACCCTG 902 CCTGTCTTCTTCTGACGTCCCCCCCTGTGGGGCCCAGCCAG	311		176
M E E L F S D V D S P Y Y D L D T V L T 196 661 CAGGCATGATGGGGGGTGCCAGGCCGGCCCCTGCGAAGGGCTCGAGGGCTTGGCTCCGG 720 G M M G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGGCGAGCGCTGGACCACGTGGTG 780 T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTGAGCAGGAGCCCTGAGTGCTCCACGCCTTGACGCATTG 840 I L V E T * 241 841 ACACGTGAGCACTGGGTCCCACGGAGGGTGCGCCTGAGTGCTCACAGCCGCCTCTGACGCATTG 900 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTTGCAGCCCTA 960 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTTGCTGC 960 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTTTCTGGAAGGCTT 1020 1021 CTTGTCTTCTGACGTCCCCCCCTGTGGGCCCCTGGGCCCAGCGTTTCTTGAAGAGCTT 1020 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGCCCCTGTGTCTCTTTTGTTCTCTTAGATAGGTTATTTTT 1200 1021 CAATTCAGTTTTACATGTTTTTGGCAGTATTTTTTTTTT	601	.	660
661 CAGGCATGATGGGGGGTGCCAGGCCGGGCCCCTGCAAAGGGCTCGAGGGCTTGGCTCCGG G M M G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGGCGAGCTGGACCACGTGGTGG T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTGAGCAGGAGCCCTGAGTGCTCCACGCCTGAGCCACGTGGTGG I L V E T * 241 841 ACACGTGAGCCACTGGCTCCACGAGAGACCCCTGAGTGCCCACGCCCTCTGACGCCTTGCTGC 901 CCTGTCTGCTGATTCTGAGAAAATCCCAGAACAGCCCCATTACCAGTGGGCCCAGCCTTGCTGC 902 GCCCGTCCCACTCACCTCCCCCCTGTGGAGCCCCAGCGTGCTGCTGCCCACGCCTTGCTGC 903 GCCCGTCCCACTCACCTCCCCCCTGTGGAGCGCCCAGCGTGCTGCTGCCCACGCCTTGCTGC 904 GGCCCGTCCCACTCACCTCCCCCCTGTGGAGCGCCCAGCGTGCTGCTGCCCACGCCTTGCTGC 905 GCCCGTCCCACTCACCTCCCCCCTGTGGAGCGCCCAGCGTGTCTCTTGGAAGGCTT 1020 TTGTCTTTTGAGCTTCTCAGACACTCCCTTTTACCTTTTAGATATATTTTTTAAACTTTT 1020 TATACCTTTACATGTTTTTGGCATATTTTTTCTTTAAATATTTTTTTAAACTTTT 1200 TATACCTTTACATGTTTTTAGATTTTTTCAGCTAATTTTTTTT	001		
G M M G G A R P G P C E G L E G L A P A 216 721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGGCGAGCTGGACCACGTGGTGG 780 T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTGAGCAGGAGCCCTGAGTGCTCACAGCCGCCTTGACGCATTG 840 I L V E T * 241 841 ACACGTGAGCACTGGCTCCACGGAGAGCCCTGAGTGCTCACAGCCGCCTTGACGCATTG 960 901 CCTGTCTGGTATTCTGAGAAATCCCAGGAGACCCATTACCAGTGGGGCCCAGCCTTGCTGC 960 961 GGCCCGTCCCACTCACCTCCCCCCTGTGGAGCCCCAGCGCTGCTGCTGC 960 962 GGCCCGTCCCACTCACCTCCCCCCTGTGGAGCCCCAGCGCTTCTTTAGATAGGTGAAATTTTTA 1140 1081 AGAGGACGGTGAGCCCCACAGCCCTGGGCCCAGCGCAGAGAGTAACATTTTTA 1140 1141 CAATTCAGTTTTACATGTTTTTGGGCAGTATTTTGTCTTTAGATAGTTTTTTTT	661		
721 CCACCCCAGGCCCTAGCTCCAGCTGCAAGTCCGACCTGGGCGAGCTGGACCACGTGGTGG T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTGAGCAGGAGCCCTGAGTGCTCACAGGCGCCTCTGACGCATTG I L V E T * 241 841 ACACGTGAGCACTGGCTCCCACGGAGGGTGCCCTGCCGCCAGCGGCCCAGCCCTTGCTGC 901 CCTGTCTGCTGATTCTTGAGAAATCCCAGAACAGCCCATTACCAGTGGGCTCTAGAGGCTT 1020 1021 CTTGTCTTCTGACGACTCCCCCCTGTGGAGGCCCAGCCGAGCCTTCTGAAGGCTT 1021 CTTGTCTTCTGACGACCCCACAGCCCTTGGAGGCCCAGCCAG	001		
T P G P S S S C K S D L G E L D H V V E 236 781 AGATCCTGGTGGAGACCTGAGCAGGAGCCCTGAGTGCTCACAGCCGCCTCTGACGCATTG 840 I L V E T * 241 841 ACACGTGAGCACTGGCTCCCACGGAGGGTGCGCCTGCGCCAGCGGCCCAGCCTTGCTGC 900 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCCTA 960 961 GGCCCGTCCCACTCACCTCCCCCCTGTGGAGCCCAGCGAGAGGCTGTCTGGAAGGCTT 1020 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGCCCCCTCGTGTCTCTTTTGTGTCCCCCACTGT 1080 1081 AGAGGACGGTGAGCCCCACAGCCCTGGACCCCTCTTTTACCTTTTAGATAGGTGAATTTTA 1140 1141 CAATTCAGTTTTACATGTTTTTGGAGTATTTTTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTTCAGCTATTTTTTTTT	721		
AGATCCTGGTGGAGACCTGAGCAGGAGCCCTGAGTGCTCACAGCCGCCTCTGACGCATTG I L V E T * 241 841 ACACGTGAGCACTGGCTCCCACGGAGGGTGCGCCTGCGCCAGCGCCCAGCCTTGCTGC 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCCTA 961 GGCCCGTCCCACTCACCTCCCCCCTGTGGAGCGCCAGCAGAGGCTGTCTGGAAGGCTT 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGGCCCAGGCAGAGGCTGTTCTGGAAGGCTT 1080 1081 AGAGGACGGTGAGCCCCACAGCCCTGGGCCCTCTTTTACTTTTAGATAGGTGAATTTTTA 1141 CAATTCAGTTTTACATGTTTTGGGCAGTCATCTTTTGTCTTAAGATATATTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCATAAA 1260 CATCCTTTGCTGCTACATTAAGAACTATTTTTTTTTTTT	121		
ILVET * * 241 841 ACACGTGAGCACTGGCTCCCACGGAGGGTGCGCCTGCCGCCAGCGCCCAGCCTTGCTGC 900 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCCTA 960 961 GGCCCGTCCCACTCACCTCCCCCCTGTGGAGCGCCAGCAGAGGCTGTTCTGGAAGGCTT 1020 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGCCCCTGTGTCTCTTTTGTTCCCCCACTGT 1080 1081 AGAGGACGGTGAGCCGCAGCTGCATCAACCTCCTTTTACCTTTAGATAGGTGAATTTTTA 1140 1141 CAATTCAGTTTTACATGTTTTTGGGCAGTATTTTGTCTTAAAGATATATTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCTATAAA 1260 1261 CATCCTTTGCTGCTACATTAGAACTTTTATTTTTTTTTT	701		
841 ACACGTGAGCACTGGCTCCCACGGAGGGTGCGCCTGCCGCCAGCGGCCCAGCCTTGCTGC 901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCCTA 961 GGCCCGTCCCACTCACCTCCCCCCTGTGAGCGCCCAGGCAGAGGGCTGTTCTGGAAGGCTT 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGCCCCAGGCAGAGGGCTGTTCTTGTGTCCCCCACTGT 1080 1081 AGAGGACGGTGAGCCGCAGCCTGCATCAACCTCCTTTTACCTTTTAGATAGGTGAATTTTTA 1141 CAATTCAGTTTTACATGTTTTTGGGCAGTATTTTGTCTTAAAAGTATATTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCTATAAA 1261 CATCCTTTGCTGCTACATTAGAACTTTTTTTTTTTTTTT	781		
901 CCTGTCTGCTGATTCTGAGAAATCCCAGAACAGCCCATTACCAGTGGGGCTGCAGCCCTA 961 GGCCCGTCCCACTCACCTCCCCCTGTGGAGCGCCAGGCAGAGGCTGTTCTGGAAGGCTT 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGCCCCTCGTGTCTCTTTTGTGTCCCCCACTGT 1080 1081 AGAGGACGGTGAGCCGCAGCCTGCATCAACCTCCTTTTACCTTTAGATAGGTGAATTTTTA 1140 1141 CAATTCAGTTTTACATGTTTTTGGGCAGTATTTTGTCTTAAGATATATTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCTATAAA 1260 1261 CATCCTTTGCTGCTACATTAGAACTTTTTATAGCCTAAACAATTGCAGTTGGTGTGTTTCA 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTGTTTTTGTTTTTT			
961 GGCCGTCCCACTCCCCCCTGTGGAGCGCCAGGCAGAGGCTGTTCTGGAAGGCTT 1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGCCCCTCGTGTCTCTTTGTGTCCCCCACTGT 1080 1081 AGAGGACGGTGAGCCGCAGCTGCATCAACCTCCTTTTACCTTTAGATAGGTGAATTTTTA 1141 CAATTCAGTTTTACATGTTTTGGGCAGTATTTTGTCTTAAAAGTATATTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCTATAAA 1260 1261 CATCCTTTGCTGCTACATTAGAACTTTTATAGCCTAAACAATTGCAGTTGGTGTGTTTCA 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTTTTTTTTT			
1021 CTTGTCTTCTGACGTCCCCACAGCCCTGGGCCCCTCGTGTCTCTTTGTGTCCCCCACTGT 1081 AGAGGACGGTGAGCCGCAGCTGCATCAACCTCCTTTTACCTTTAGATAGGTGAATTTTTA 1140 CAATTCAGTTTTACATGTTTTGGGCAGTATTTTGTCTTAAGATATATTTTTTAAACTTTT 1200 TATACCTTATCTCTTTAGATTTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCTATAAA 1261 CATCCTTTGCTGCTACATTAGAACTTTTATAGCCTAAACAATTGCAGTTGGTGTGTTTCA 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTTTTTTTTT			
1081 AGAGGACGGTGAGCCGCAGCTGCATCAACCTCCTTTTACCTTTAGATAGGTGAATTTTTA 1141 CAATTCAGTTTTACATGTTTTGGGCAGTATTTTGTCTTAAGATATATTTTTTAAACTTTT 1200 1201 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCATAAA 1260 1261 CATCCTTTGCTGCTACATTAGAACTTTTATAGCCTAAACAATTGCAGTTGGTGTTTCA 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTTTTTTTTT			
1141 CAATTCAGTTTTACATGTTTTGGGCAGTATTTTGTCTTAAGATATATTTTTTAAACTTTT 1201 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTTCAAAACTTTT 12101 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTCTATAAA 1221 CATCCTTTGCTGCTACATTAGAACTTTTATAGCCTAAACAATTGCAGTTGGTGTGTTTCA 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTTTTTTTTT			
1201 TATACCTTATCTCTTTAGATTTTTCAGCTATTTTCTTAAAAGTATATTTTTCTATAAA 1260 1261 CATCCTTTGCTGCTACATTAGAACTTTTATAGCCTAAACAATTGCAGTTGGTGTGTTTCA 1320 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTTTTTTTTT	1081		
1261 CATCCTTTGCTGCTACATTAGAACTTTTATAGCCTAAACAATTGCAGTTGGTGTGTTTCA 1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTTTTTTTTTT	1141		
1321 TTTTTTTAAGGTTTAAATAAGGGTTTTTTGTTTTGTTT	1201		
1381TACAGTCTCAGTCAACAGTGTGAATGTATCATGTTTTACTTTAAATGTGTGTG	1261		
1441 TCTTCATTATGTCCTGCGCTGCAGTGAGACCTGGGTGAAAATCAGGAGCCGCACACAGCC 1500 ACATCTTCCTAGACCTAAGAGTAAATTATGGAGGATTTTATTTA	1321		
1501 ACATCTTCCTAGACCTAAGAGTAAATTATGGAGGATTTTATTTA	1381		
1561AATGTCATTGAAGACAAAGGTCAAATATTTGTCTGTTTGTAGATCACAGGCACCAGTTGG16201621TCTTCAGGGACCTCATAGCCCCTCGGTGGTGCCTTCTCAAGGCAGTGTTCCTGGAGGCTC16801681CCATCAGGGTCAGCCCATGCACCTGCCCTGGGTGAGGAAGTAGCATTGCTGCTGGATGAG17401741AAACGCCTGCGCTGCTCTGTTAGACTGGTGCTGAAACAAAAGGTTAAGGCTAGGTTGAAG18001801TCTAGAATGAAAGAAATCTGAATCCATGTCATTCATAACCCCTTGATCTGTAGTGTCATG18601861GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACTCCTGCCCCGC19201921CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCAACTTCCTCACCCCTTAACCAAA19801981AAGGTGTGTTTTCTTTTTTTTTTTTTTTTTTTTTTTTTT			1500
1621 TCTTCAGGGACCTCATAGCCCCTCGGTGGTGCCTTCTCAAGGCAGTGTTCCTGGAGGCTC 1680 1681 CCATCAGGGTCAGCCCATGCACCTGCCCTGGGTGAGGAGTTTGCTGCTGGATGAG 1740 1741 AAACGCCTGCGCTGCTCTGTTAGACTGGTGCTGAAACAAAAGGTTAAGGCTAGGTTGAAG 1800 1801 TCTAGAATGAAAGAAATCTGAATCCATGTCATTCATAACCCCTTGATCTGTAGTGTCATG 1860 1861 GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACTCCTGCCCCGC 1920 1921 CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCAACTTCCTCACCCCTTAACCAAA 1980 1981 AAGGTGTGTTTTCTTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT 2040	1501	ACATCTTCCTAGACCTAAGAGTAAATTATGGAGGATTTTATTTA	_
1681CCATCAGGGTCAGCCCATGCACCTGCCCTGGGTGAGGAAGTAGCATTGCTGCTGGATGAG17401741AAACGCCTGCGCTGCTCTGTTAGACTGGTGCTGAAACAAAAGGTTAAGGCTAGGTTGAAG18001801TCTAGAATGAAAGAAATCTGAATCCATGTCATTCATAACCCCTTGATCTGTAGTGTCATG18601861GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACTCCTGCCCCGC19201921CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCAACTTCCTCACCCCTTAACCAAA19801981AAGGTGTGTTTTCTTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT2040	1561	AATGTCATTGAAGACAAAGGTCAAATATTTGTCTGTTTGTAGATCACAGGCACCAGTTGG	1620
1741AAACGCCTGCGCTGCTCTGTTAGACTGGTGCTGAAACAAAAGGTTAAGGCTAGGTTGAAG18001801TCTAGAATGAAAGAAATCTGAATCCATGTCATTCATAACCCCTTGATCTGTAGTGTCATG18601861GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACTCCTGCCCCGC19201921CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCTAACTTCCTCACCCCTTAACCAAA19801981AAGGTGTGTTTTCTTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT2040	1621	TCTTCAGGGACCTCATAGCCCCTCGGTGGTGCCTTCTCAAGGCAGTGTTCCTGGAGGCTC	1680
1801TCTAGAATGAAAGAAATCTGAATCCATGTCATTCATAACCCCTTGATCTGTAGTGTCATG18601861GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACCCCTGCCCCGC19201921CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCTAACTTCCTCACCCCTTAACCAAA19801981AAGGTGTGTTTTCTTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT2040	1681	CCATCAGGGTCAGCCCATGCACCTGCCCTGGGTGAGGAAGTAGCATTGCTGCTGGATGAG	1740
1861GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACTCCTGCCCCGC19201921CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCTAACTTCCTCACCCCTTAACCAAA19801981AAGGTGTGTTTTCTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT2040	1741	AAACGCCTGCGCTGCTCTGTTAGACTGGTGCTGAAACAAAAGGTTAAGGCTAGGTTGAAG	1800
1921 CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCTAACTTCCTCACCCCTTAACCAAA 1980 1981 AAGGTGTGTTTTCTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT 2040	1801	TCTAGAATGAAAGAAATCTGAATCCATGTCATTCATAACCCCTTGATCTGTAGTGTCATG	1860
1921 CTCACCCCACATGCTCCCTGTTTCTCATGCTTTCTCTAACTTCCTCACCCCTTAACCAAA 1980 1981 AAGGTGTGTTTTCTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT 2040	1861	GGTGCTGCCGCAGGCAGGGAGTGAGCTGGGGGTGCCTGCAGCCTTCCACTCCTGCCCCGC	1920
			1980
	1981	AAGGTGTGTTTTCTTTTGTGCATATAGCCATTCTTAAATATCAGTGATGTAAACCTCACT	2040

Title: HEPP, A Novel Gene with a R Hematopoietic and Neural Developme Attorney Docket No. 39532.176599

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FIGURE 2

Mouse Human	 1	mfarglkrkyg <mark>doeegye</mark> gfgtv <mark>p</mark> sysloroslldmslvklolchmlvepnlcrsv mfarglkrk <mark>cvgheedvegala</mark> glk <mark>tvs</mark> sysloroslldmslvklolchmlvepnlcrsv
Mouse	 57	LIANTVRQIQEEMSQDGVWHGMAPQNVDRAPVERLVSTEILCRTVRGAEEEHPAPELEDA
Human	61	LIANTVRQIQEEMTQDGLWRTVAPQAAERAPLDRLVSTEILCRAAWGQEGAHPAPGLGDG
Mouse	 117	PLONSVSELPIVGSAPGORNPQSSLWEMDSPQENRGSFOKSLDQIFETLENKNSSSYEEL
Human	121	HTQGPVSDLCPVTSAQAPRHLQSSAWEMDGPRENRGSFHKSLDQIFETLETKNPSCMEEL
Mouse	 177	FSDVDSSYYDLDTVLTGMMSGTKSSLCNGLEGFAAATPPPSSTCKSDLAELDHVVEILVE
Human	181	FSDVDSPYYDLDTVLTGMMGGARPGPCEGLEGLAPATPGPSSSCKSDLGELDHVVEILVE
Mouse Human	 237 241	

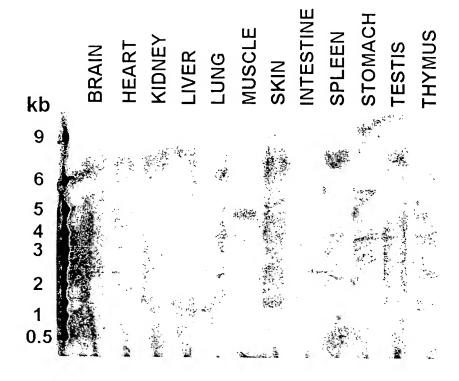
Zebrafish Hepp	1	MFSKGIKRKFADGGEEISDDGLVAARVASSYSLQRQSLLDMSLIKLQLCHMLVEPNLCRS
Mouse Hepp	1	MFARGLKRKYGDOEEGVEGFGTVPSYSLQRQSLLDMSLVKLQLCHMLVEPNLCRS
Human HEPP	1	MFARGLKRKCVGH-EEDVEGALAGLKTVSSYSLQRQSLLDMSLVKLQLCHMLVEPNLCRS
Zebrafish Hepp Mouse Hepp Human HEPP	56	VLIANTVRQIQEEMTHOGSWHMVTEAFCGASQSPSERLVETEVLCR

FIGURE 4B

FIGURE 4A

kb

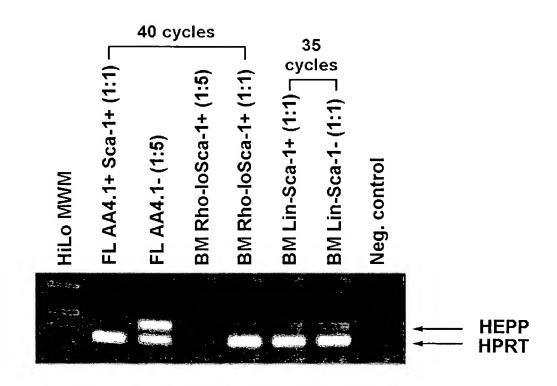
New U.S. Patent Application Inventors: R. JURECIC et al. Title: HEPP, A Novel Gene with a Role Hematopoietic and Neural Development" Attorney Docket No. 39532.176599 Sheet 4 of 14



BRAIN
HEART
KIDNEY
LIVER
LUNG
MUSCLE
SKIN
INTESTINE
SPLEEN
STOMACH
TESTIS
THYMUS

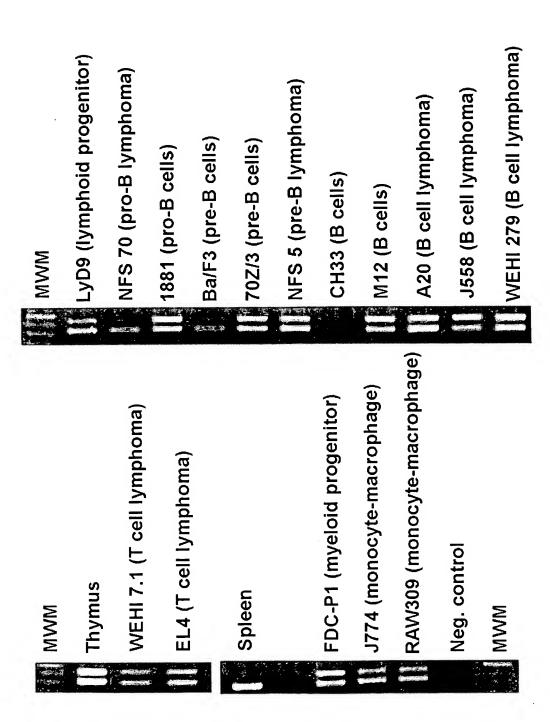
FIGURE 5

New U.S. Patent Application
Invent R. JURECIC et al.
Title P, A Novel Gene with a Role in
Hematopoietic and Neural Development"
Attorney Docket No. 39532.176599
Sheet 5 of 14



New U.S. Patent Application Inventors: R. JURECIC et al. Title: HEPP, A Novel Gene with a Role in Hematopoietic and Neural Development" Attorney Docket No. 39532.176599

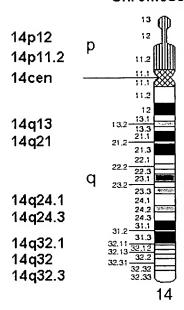
Sheet 6 of 14



New U.S. Patent Application
Inventors: R. JURECIC et al.
Title: HEPP, A Novel Gene with a Role
Hematopoietic and Neural Development"
Attorney Docket No. 39532.176599
Sheet 7 of 14

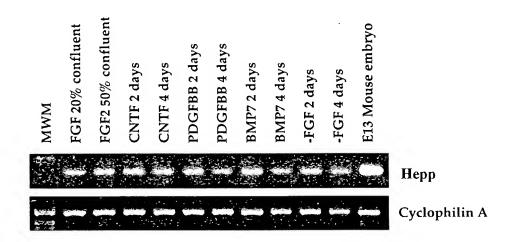
FIGURE 7

Chromosome 14



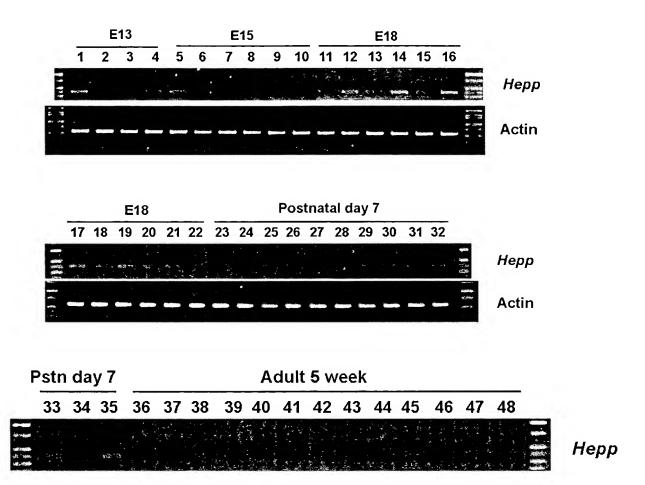
translocation breakpoints

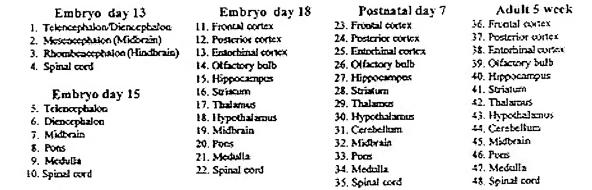
New U.S. Patent Application Inventors: R. JURECIC et al. Title: HEPP, A Novel Gene with a Round Hematopoietic and Neural Development" Attorney Docket No. 39532.176599 Sheet 8 of 14



New U.S. Patent Application
Inventors: R. JURECIC et al.
Title: HEPP, A Novel Gene with a RoHematopoietic and Neural Development"
Attorney Docket No. 39532.176599

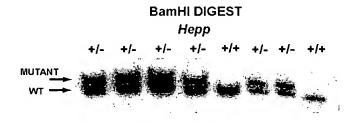
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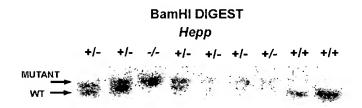


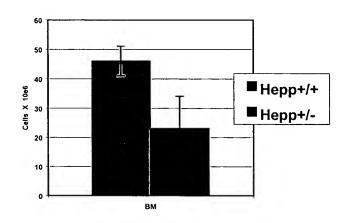


New U.S. Patent Application
Inventors: R. JURECIC et al.
Title: HEPP, A Novel Gene with a Role in
Hematopoietic and Neural Development"
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FIGURE 10



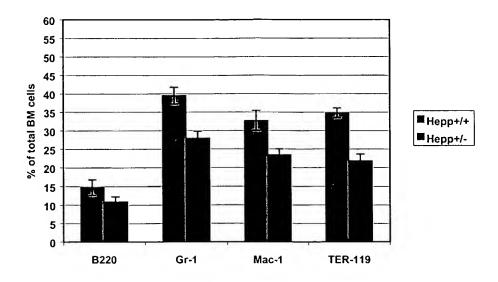


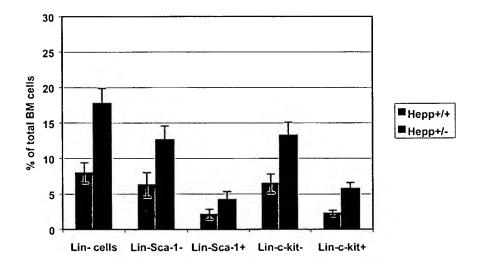


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FIGURE 12





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FIGURE 14

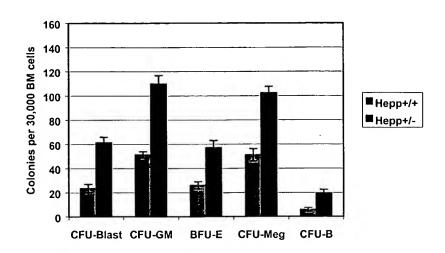
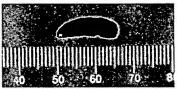


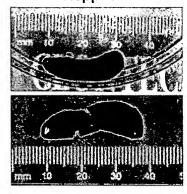
FIGURE 15A-B

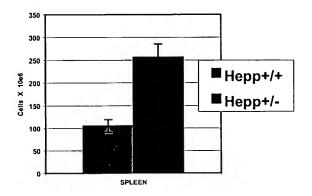
FIGURE 15C



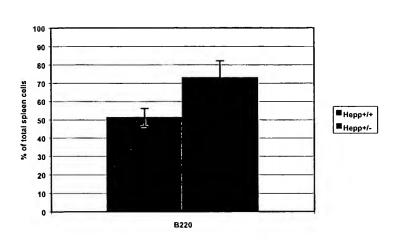


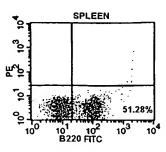
Hepp +/-





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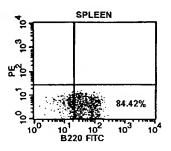
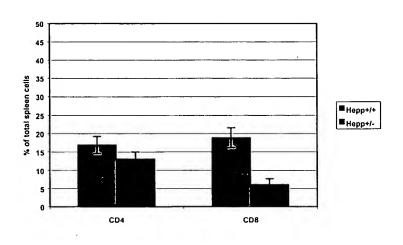
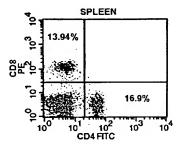
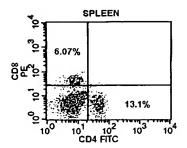


FIGURE 17









New U.S. Patent Application Inventors: R. JURECIC et al. Title: HEPP, A Novel Gene with a Hematopoietic and Neural Development" Attorney Docket No. 39532.176599 Sheet 14 of 14

FIGURE 18A



FIGURE 18B



FIGURE 18C

